1.9 Rational Exponents

Warm up:

1) 7^2 =

2) $\sqrt{49}$ =

3) 3^3 =

4) $\sqrt[3]{27}$ =

5) 5^4 =

6) $\sqrt[4]{625}$=

7) $(-3)^3$ =

8) $\sqrt[3]{-27}$ =

9) $\sqrt[3]{8}$ =

10) $\sqrt[4]{81}$ =

11) $\sqrt[4]{-16}$ =

12) $\sqrt[3]{-125}$ =

If $b^n = a$ then $\sqrt[n]{a} = b$

or $a^{\frac{1}{n}} = \sqrt[n]{a} = b$

Note that $\sqrt[n]{a}$ does not exist if n is even and a < 0

Example: $\sqrt[2]{-64}$ and $\sqrt[4]{-64}$ don't exist

Where as $\sqrt[3]{-64}$ = -4, because
$(-4)^3 = (-4)(-4)(-4) = -64$

Ex 1: Evaluate:

1) $169^{\frac{1}{2}}$ =

2) $(-169)^{\frac{1}{2}}$ =

3) $-169^{\frac{1}{2}}$ =

4) $125^{\frac{1}{3}}$ =

5) $(-125)^{\frac{1}{3}}$ =

Ex 1: Evaluate:

6) $-125^{\frac{1}{3}}$ =

7) $\sqrt[3]{2^3}$ =

8) $144^{-\frac{1}{2}}$ =

9) $\sqrt[3]{-\frac{8}{27}}$ =

Ex 2: Simplify:

a) $\sqrt[3]{\frac{8x^9}{x^3}}$

b) $\left(\frac{9a^{-2}}{b^4}\right)^{-\frac{1}{2}}$

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Practice:
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